



US Army Corps  
of Engineers  
North Central Division

# GREAT LAKES LEVELS

Update Letter No. 98

September 2, 1993

## Lighthouses on the Great Lakes

A great deal of romance and adventure are associated with ships and sailing. Throughout the world, sailors have plied the waterways in search of new adventures, carrying cargo and passengers to distant lands. Among these routes are the inland seas known as the Great Lakes, providing a waterway into mid America. As on the oceans, the Great Lakes and their connecting channels are oft-times beset with

similar hazards, the threat of sudden storms, and dangerous shoals. Today's sailors have radar and sonar to assist them, but yesterday's mariners had to rely on crude charts and maritime aides such as buoys, horns, and lights to mark their way. There are 366 U.S. and Canadian lighthouses still existing on the Great Lakes. This article is directed at several of those that are on Lake Superior (Figure 1).

In 1804, the first lighthouse on the Great Lakes was built on Canadian shores near the mouth of the Niagara River. In 1818, two lighthouses were constructed at Buffalo, New York and Erie, Pennsylvania, respectively. This heralded the beginning of an era of famous lights on the Great Lakes. Beginning in 1830, water borne commerce began to flourish, and coastal town promoters encouraged govern-

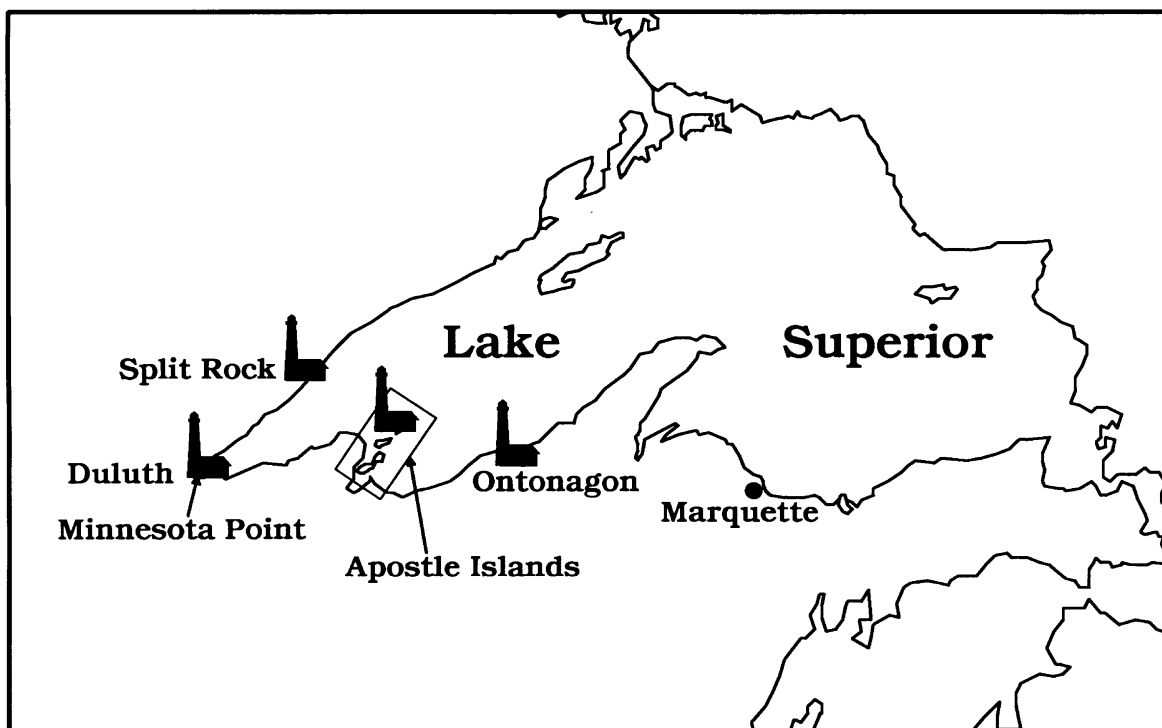


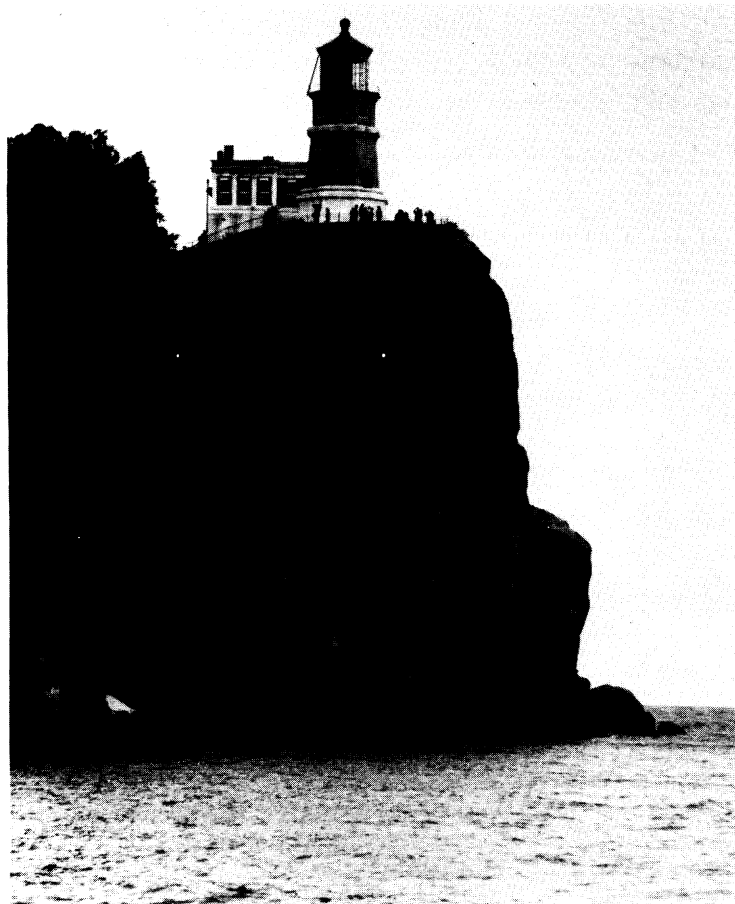
Figure 1. Location of Lake Superior Lighthouses.

ment assistance to erect lighthouses and navigation markers. As described in an earlier update article, the Corps' U.S. Lake Survey District was instrumental in charting the Great Lakes, providing a great service to those building along the shores as well as those navigating the waters. An example of how quickly shipping took hold in the Great Lakes, is seen in the statistics at Sault Ste. Marie, Michigan and Ontario. As early as 1910, the Soo Canal was handling four times the cargo of the Suez Canal and six times as much as the Panama Canal, while the total freight handled at the Duluth-Superior Harbor on Lake Superior, was greater than at the world renowned harbors of New York or London.

### **Federal Lighthouse Jurisdiction**

Federal authority for maintaining lighthouses was established by the United States Congress on August 7, 1789. The nation's lighthouses and equipment deteriorated under the jurisdiction of the Fifth Auditor of the Treasury from 1820 to 1852. This was due in great part to Stephen Pleasonton, the Fifth Auditor who had a bookkeeping background with little maritime or engineering experience. It seems he was more concerned with the upkeeping costs of the lighthouse system, rather than the many advances in lighting such as the Fresnel lens, which produced a single beam with ranges nearly twice that of lights in use. This

lens was quickly adopted in France and England where it earned an excellent reputation. One may surmise that he ignored such a product because of his dealings with a close associate, Captain Winslow Lewis, who was a supplier of lighting equipment for most United States lighthouses. A nephew of Lewis, acting in an official capacity, blasted Pleasonton and his uncle on their incompetency. Eventually in 1852, Congress created a nine-member Lighthouse Board to manage the entire U.S. lighthouse system. With the Lighthouse Board in charge, Fresnel lens were installed in 75 lighthouses on the Great Lakes between 1854 and 1857, many of which are still in use. In 1910, a Lighthouse Bureau replaced the Lighthouse



**Figure 2. Split Rock Lighthouse, Courtesy of Minnesota Historical Society.**

Board and in 1939, the Lighthouse Bureau was absorbed by the United States Coast Guard.

### **Lighthouses of the Apostle Islands**

One of the navigational hazards on Lake Superior is the Apostle Islands, made up of twenty-two islands located off the Wisconsin shore. The first lighthouse, placed on the islands in 1857, was originally slated for LaPoint on Madeline Island (the only island with permanent residency). The regional office of the Secretary of the Treasury initially changed the location to Long Island. However, when the construction team arrived in the

area they were misdirected and they built the lighthouse on Michigan Island, approximately seventeen miles from the originally planned location. In 1858, a lighthouse was eventually built on Long Island. At that time, the lighthouse on Michigan Island was turned off. In the course of time it was re-lit in 1969. Raspberry Island received a lighthouse in 1863, Outer Island in 1874, Sand Island in 1881, and Devil's Island in 1891. In total there are six lighthouses in the Apostle Islands, which were all automated by 1978, including the addition of solar power. With the exception of Madeline Island, all of the islands are part of the National Lakeshore Park System.

### **Split Rock Lighthouse**

One of the most violent storms ever recorded on Lake Superior occurred on November 28, 1905. Update Letter Number 88, November 1992 highlighted this storm and the various shipwrecks it caused on the Great Lakes. In this particular storm two ships were demolished and one grounded near Split Rock, Minnesota. This inadvertently brought about the construction of the Split Rock Lighthouse (see Figure 2). The Lake Carriers' Association, in their 1907 Annual Report, gave the following reasons for the necessity of a lighthouse at Split Rock: 1. The uncertain variation of the



**Figure 3. Charcoal Drawing of Minnesota Point Lighthouse, Courtesy of Duluth Public Library, Canal Park Marine Museum Collection.**

compass due to vast metallic deposits in the area; 2. there are no soundings available until visible shore is reached; 3. the dangerous character of the shore; and, 4. during the previous three years over \$1,000,000 worth of vessels and cargos had been wrecked in the vicinity. Construction of the Split Rock Lighthouse was started in 1909. A bridge was built to bring materials into the shallow shore in a small cove near the Split Rock. A hoist engine was then mounted on skids and made to pull itself up to the top of the outcrop where it was permanently mounted. All the men and materials needed to construct the lighthouse were hoisted one

hundred feet up the rock outcropping by a tackle connected to the hoist engine. In 1915, construction began on a tramway that enabled supplies to be brought into the small cove rather than up the rock outcrop. Access by road to the Split Rock Lighthouse was completed in 1924. Sadly, in 1969, the Split Rock Lighthouse was decommissioned, however, it is open to the public as part of Minnesota's Park System.

### **Ontonagon Lighthouse**

During the period from 1850 to 1860, Ontonagon, Michigan, on Lake Superior, became a shipping center for the copper industry. In

1853, the first lighthouse was constructed. Subsequently, a new lighthouse was constructed in 1886, with the lighthouse tower attached to the two story lightkeeper's dwelling. The tower could be accessed from outside as well as from both the first and second floors of the dwelling. The lighthouse was closed in 1964 after 110 years of continuous service. Throughout its entire years of service, only nine men had staffed the Ontonagon Lighthouse. Following its closure, the lighthouse was leased as a private residence to its last keeper - Arnold Huuki. In 1965 it became property of the United States Army Corps of Engineers. Since 1974 it has



**Figure 4. Ontonagon Lighthouse Roof Repair.**

been leased to the U.S. Coast Guard Auxiliary of Ontonagon. The lighthouse was placed on the National Register of Historic Places in 1975, and is currently used by the Ontonagon County Historical Society, and the Coast Guard Auxiliary. Although the lighthouse is not open to the public, it is possible, upon request, to obtain a guided tour from the Coast Guard Auxiliary.

### **Minnesota Point Lighthouse**

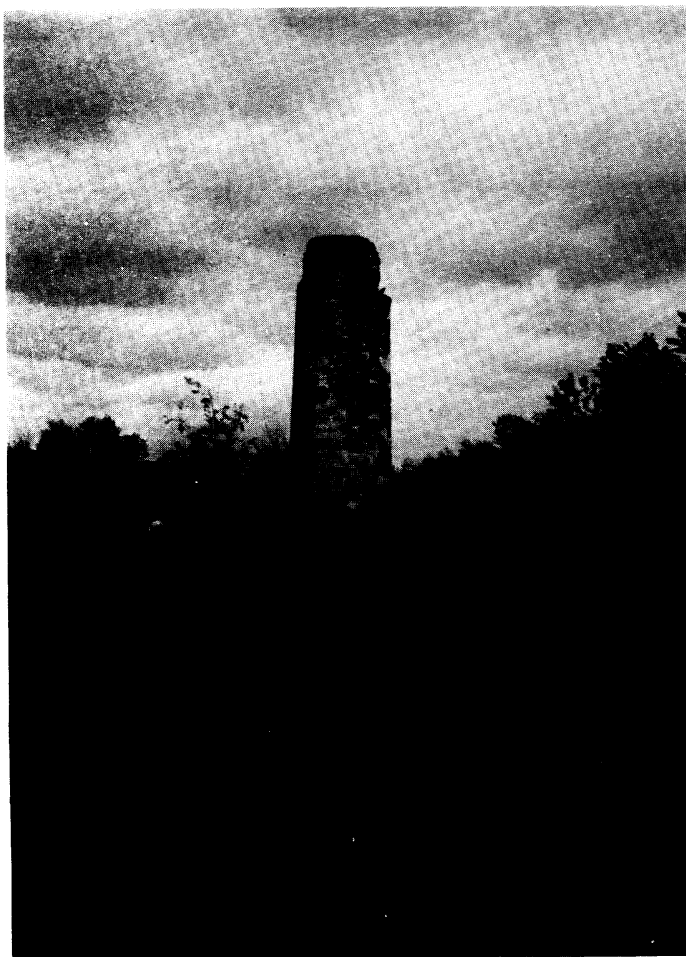
The lighthouse at Minnesota Point in Duluth, Minnesota was constructed between 1857 and 1858 (See Figure 3). This was the first high powered light beacon on Lake Superior. During its

twenty years of operation, a total of six keepers operated the facility that was considered the finest lighthouse on the Great Lakes. It was abandoned in 1878. Remnants of the abandoned tower were permitted to stand after a request was honored from the Geodetic Department at Washington to the United States Lighthouse Board. A copper bolt marker on the base of the tower indicates that it is the location of the "zero" point from which the original surveys used in mapping Lake Superior began. The remains are Duluth's oldest landmark and a reminder of the earliest days of light beacon navigation on Lake Superior. It was placed on the National

Register of Historic Places in 1974.

### **Bicentennial Lighthouse Fund**

The Fiscal Year 1988 Continuing Resolution, P.L. 100-202, provided money in the Historic Preservation Fund for the establishment of a Bicentennial Lighthouse Fund in recognition of the 200th anniversary of the Federal Lighthouse Program. The Program is intended to emphasize, to the degree appropriate, rehabilitation, preservation, and public use of U.S. lighthouses and related structures. The Corps of Engineers, Detroit District, submitted applications in 1990 to



**Figure 5. Remaining Tower at Minnesota Point Lighthouse.**

obtain funds to improve the Ontonagon Lighthouse (See Figure 4). Funds were received for roof repairs, which were completed, meeting all specifications of the National Park Service, National Register, and State Historic Preservation Officer's prescribed regulations. An application to secure the remaining thirty-five feet of the original fifty feet of tower left at Minnesota Point (See Figure 5) was not funded. It was intended to place a fence around the remaining structure to protect it from continuing tourist traffic and vandalism.

### **Additional Information**

Lighthouses or lights on the Great Lakes are generally no longer manned. Many have been saved and converted into private homes, museums, or part of county, state, or national parks. The Great Lakes Lighthouse Keepers Association, a non-profit organization, was incorporated in 1983 to facilitate the accumulation and exchange of information about the histories of the lighthouse stations and their keepers. This association has an open membership policy and various brochures and publications are available to the public by contacting: Great Lakes Lighthouse Keepers Association, P.O. Box 580, Allen Park, Michigan, 48101. The Michigan Department of Transportation also has information on Michigan lighthouses; they can be contacted at Michigan Department of Transportation, Public Information Office, P.O. Box 30050, Lansing, Michigan 48909.

Lighthouse locator maps

(unfolded posters) can be ordered from The Historical Society of Michigan, 2117 Washtenaw, Ann Arbor, MI 48104, (313) 769-1828. One map has U.S. and Canadian lighthouses on Lakes Superior and Michigan; the second map has lighthouses on Lakes Huron, Erie and Ontario.

### **References**

Bouge, Margaret Beattle and Virginia A. Palmer, **Around the Shores of Lake Superior**, The University of Wisconsin Sea Grant College Program, 1979.

Bouge, Margaret Beattle, **Around the Shores of Lake Michigan**, The University of Wisconsin Press, 1985.

Hyde, Charles K., **The Northern Lights**, Two Peninsula Press, Lansing, Michigan 1986.

Minnesota Historical Society, **Split Rock Epoch of a Light House**, 1978.

Penrose, Laurie and Bill Penrose, **A Traveler's Guide to 116 Michigan Lighthouses**, Friede Publications, 1992.

### **Acknowledgment**

Many thanks to Lee Radzak, Curator at the Split Rock Lighthouse, Dave Synder, Apostle Islands Historian, and the Great Lakes Lighthouse Keepers Association, for materials provided for the preparation of this article.

## **Lake Ontario Regulation**

With Lake Ontario's level declining to well below the upper regulation limit and approaching average, the St. Lawrence River Board of Control recommended termination of Criterion (k). This was approved by the International Joint Commission on August 23rd. Now the outflows for the weekly regulation of Lake Ontario are generally those of the Regulation Plan 1958-D.

## **Great Lakes Storm Damage Reporting System**

In response to an assignment from the North Central Division, the Chicago District's Economic Analysis Branch has developed a Great Lakes Storm Damage Reporting System (GLSDRS). It is designed as a near "real-time" reporting system for estimating the monetary and physical impacts on residential riparian property caused by storm events and associated flooding and erosion along the U.S. shoreline of the Great Lakes.

Criteria were established and quantified by Coastal Engineers to define storm events sufficient in magnitude to "trigger" data collection. These criteria include: wind velocity, storm duration, wave height and wind direction.

Field trials are now commencing for a system whose components include:

\*Daily receipt of meteorological/environmental data transmitted by CoastWatch, an entity of the National Oceanic &

Atmospheric Administration (NOAA).

\*Immediate post-storm telephone interviewing of respondents whose riparian properties were chosen to be representative of a given reporting area so that area parameters can be validly inferred from sample findings.

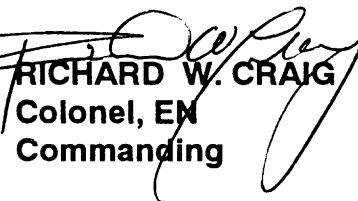
Compilations of U.S. Great Lakes' residential riparian properties were developed in the IJC Levels Reference Study.

\*Issuance of post-storm event reports, including estimates of property and monetary damage by residential riparian property owners, is a part of this GLSDRS.

NOAA's CoastWatch is designed to provide a rapid supply of up-to-date coordinated, near real-time, environmental data products including remotely sensed products. Marine weather observations from stations in the Great Lakes region are routinely collected by the NOAA National Weather Service Forecast Office at Cleveland, Ohio. The Great Lakes Environmental Research Laboratory (GLERL) at Ann Arbor, Michigan has downloaded and archived these data since August, 1987. The observation network is comprised of 117 fixed stations including 14 moored buoys, 8 CMAN (Coastal Marine Automated Network) stations, 10 OMR (Other Marine Reports (wind data only) stations, 11 surface synoptic stations, and 44 surface airways stations. In addition, many commercial cargo ships provide regular meteorological reports which are included in this data base. Frequency of observational reporting ranges

from twice per hour to once every 6 hours, depending on the type of station. Thus, the marine weather observations do vary in frequency and completeness of reporting by area, but the CoastWatch data are the most relevant and complete currently available data to support the development of the GLSDRS.

Field trials to pilot-test the new system will continue for the remainder of FY93 and into FY94, as required. For further information contact Dr. Dave Wallin at (312) 886-6079 or Mr. Kim Bloomquist at (312) 353-6475, or by writing to the U.S. Army Corps of Engineers, Chicago District, Planning Division, 111 N. Canal Street, (6th Floor), Chicago, IL 60606-7206.



**RICHARD W. CRAIG**  
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Commanding

## Great Lakes Basin Hydrology

August basically saw a continuation of the recent trend in precipitation on most basins of the Great Lakes. For Lakes Michigan-Huron, precipitation was again above average, while that on the Lakes Erie and Ontario basins continued below average. On the Lake Superior basin, slightly below average precipitation in August contrasted with the above average precipitation of recent months. For the year to date, precipitation is near average on all the Great Lakes basins. In August, the net supply of water to the lakes was above average on Lakes Superior and Michigan-Huron, and below average on Lakes Erie and Ontario. Precipitation, water supply, and outflow information for August are provided in Table 1.

In comparison to their long-term (1900-1992) averages, the August monthly mean water levels of Lakes Superior, Michigan-Huron, St. Clair, Erie and Ontario were 3, 10, 15, 13 and 5 inches, respectively, above average. Shoreline residents on Lakes St. Clair and Erie, and to a lesser extent Lakes Michigan-Huron, are cautioned to continue to be alert to adverse weather conditions, as these could compound an already high lake level situation. Further information and advice will be provided by the Corps of Engineers should conditions worsen.

**Table 1**  
**Great Lakes Hydrology<sup>1</sup>**

PRECIPITATION (INCHES)								
BASIN	AUGUST				YEAR-TO-DATE			
	1993 <sup>2</sup>	Average (1900-1991)	Diff.	% of Average	1993 <sup>2</sup>	Average (1900-1991)	Diff.	% of Average
Superior	3.1	3.2	-0.1	97	21.7	19.5	2.2	111
Michigan-Huron	3.8	3.1	0.7	123	23.4	20.6	2.8	114
Erie	1.8	3.2	-1.4	58	23.3	23.6	-0.3	99
Ontario	2.5	3.1	-0.6	81	23.5	22.9	0.6	103
Great Lakes	3.2	3.1	0.1	103	22.9	21.0	1.9	109

LAKE	AUGUST WATER SUPPLIES <sup>3</sup> (CFS)		AUGUST OUTFLOW <sup>4</sup> (CFS)	
	1993	Average (1900-1992)	1993	Average (1900-1992)
Superior	127,000	101,000	88,000	84,000
Michigan-Huron	90,000	55,000	207,000 <sup>5</sup>	195,000
Erie	-32,000	-12,000	223,000 <sup>5</sup>	207,000
Ontario	2,000	8,000	306,000	253,000

<sup>1</sup>Values (excluding averages) are based on preliminary computations.

<sup>2</sup>Estimated.

<sup>3</sup>Negative water supply denotes evaporation from lake exceeded runoff from local basin.

<sup>4</sup>Does not include diversions.

<sup>5</sup>Reflects effects of ice/weed retardation in the connecting channels.

CFS = cubic feet per second.

**For Great Lakes basin technical assistance or information, please contact one of the following Corps of Engineers District Offices:**

**For NY, PA, and OH:**  
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**For IL and IN:**  
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**For MI, MN, and WI:**  
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